

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

In re Application of:

TAE JIN EOM ET AL.

Serial No. 08/239,313

Filed: May 6, 1994

For: BIOLOGICAL DE-INKING
METHOD

Examiner: Hastings, K.

Art Unit: 1303

DECLARATION OF DOUGLAS E. EVELEIGH UNDER 37 CFR § 1.132

DOUGLAS E. EVELEIGH, PH.D., declares as follows:

1. I am an expert in the areas of enzymology and biochemistry. I am currently a Professor in the Department of Microbiology at Rutgers- the State University, New Brunswick, New Jersey. Attached is a copy of my Curriculum Vitae.

2. My declaration is based on my scientific experience and understanding of the subject matter as an expert in the art.

3. I have read the complete English translation of Japanese Patent 63-59494 ('494 patent). In my expert opinion, the '494 patent, read in its entirety, teaches one of ordinary skill in the art only the use of cellulase, either concurrently or sequentially, with deinking chemicals. It is also my opinion that the '494 patent does not teach or even suggest to those skilled in the art the use of cellulase alone for deinking waste papers.

4. I have read the Office Action dated November 7, 1995 and January 4, 1995. It is my expert opinion that the interpretation of the '494 patent, made by the U.S. Patent Office, is

incorrect in that the teaching of the '494 patent is mischaracterized by finding the '494 patent teaches use of cellulase alone, in the absence of deinking chemicals, to deink waste paper.

The Office Action states that it is not a major conceptual approach to one skilled in the art of cellulolysis to use an enzyme alone. This conclusion, with regard to cellulolysis by cellulase enzymes, is inappropriate. In the cellulase art, there are twenty years of published detailed studies from commercial, academic and government laboratories that emphasize that chemical modification and treatment is essential and necessary for efficient cellulolysis. Therefore, to one skilled in the cellulase art, the de-inking action of cellulase alone is extremely novel and unusual. The teaching of using cellulase alone is not found in the '494 patent.

5. The teachings of the art concerning cellulase activity is that effective treatment of a cellulase substrate requires chemicals to loosen up the cellulose structure to achieve cellulolysis. There is a history of twenty years of teachings that cellulosic substrates must undergo chemical treatment to make them susceptible to cellulase enzyme action. The published scientific literature is replete with international studies in this regard. The teachings of the numerous published studies indicating that cellulase alone is ineffective in attacking cellulose is in stark contrast to the Examiner's finding that use of cellulase alone is taught or suggested in the '494 patent. It is my opinion that no one skilled in the art of cellulases would waste time, money or effort in evaluating cellulase alone and without its combination with other de-inking agents.

6. An additional teaching in the art is that hydrolase enzymes, such as cellulase, that attack insoluble substrates, such as cellulose, are unique. Enzymes attacking insoluble substrates fall into a distinct class and are different from other types of enzymes in many ways. One skilled in the art of cellulolysis would not use cellulases in the same manner as other types of enzymes. One skilled in the art of cellulolysis would not expect cellulases to respond in the same manner as

other types of enzymes. Therefore, generalizations from other types of enzymes cannot be applied to cellulase enzymes.

7. In summary, it is my expert opinion that the U.S. Patent Office has misinterpreted the '494 patent, and that at the time of the invention, the disclosure of the '494 patent taught the deinking of waste papers by the use of chemical deinking agents and cellulase, and did not teach or suggest the use of cellulase alone to deink waste papers. It is clear to me that any person skilled in the use of cellulase would not use cellulase alone. The '494 patent does not address the uniqueness of cellulases and does not provide a teaching that would enable one to use the unique cellulase enzyme alone.

8. The undersigned declares that all statements made herein of his own knowledge are true and that all statements made on information and belief are believed to be true and further that these statements are made with the knowledge that willful false statements and the like are punishable by fine or imprisonment or both under 18 U.S.C. § 1001, and that such willful false statements may jeopardize the validity of the above-referenced application or any patent issuing thereon.

Date: April 8 1996

Douglas E. Eveleigh
Douglas E. Eveleigh, Ph.D.